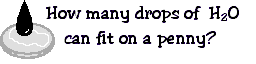
Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_



**Research Question:** Water has properties that make it unique. Two of the properties are adhesion and cohesion. How will these properties affect the number of drops that can be added to a penny before the water runs over the edge?

**Hypothesis:** How many drops of water can fit on one side of a penny?

**Variables:**

Independent Variable: Testing liquid

Dependent Variable: Number of drops that fit on the penny.

Constants: penny, water, dropper,

**Materials:**

One penny, dropper, pair of tweezers, sample of testing liquid You will also need to provide a clean water source for rinsing pennies (sink) and plenty of paper towels.

***Safety Rules:***

• Always wear safety goggles when experimenting with chemicals (soap). • Never taste chemicals (or other substances) used for a lab experiment. • Keep lids on all containers when not in use. • Clean up spills immediately.

• If any substance gets into your eyes or in a cut on your skin, notify your teacher and follow his/her directions. • Wash your hands before and after an experiment. • Clean up your lab area and materials after an experiment and return materials to their proper location

**Procedures:**

**Part A: Perform a CONTROL test for comparison with later results.**

Step 1: Rinse a penny in tap water and dry completely.

Step 2: Place the penny on paper towel.

Step 3: Use an eye dropper to place drops of WATER on the penny (one at a time) until ANY amount of water runs over the edge of the penny.

Step 4: Record the number of drops for that trial in the table.

Repeat Steps 1 - 4 three more times before calculating your average.

**Part B: Perform tests with the TESTING LIQUID.**

Step 1: Start with a “clean” penny. Rinse the penny in tap water and dry completely. Be sure to remove as much residue as possible - without using soap!

Step 2: Hold the penny with the tweezers provided, then dip it into the TESTING LIQUID. Allow extra liquid to drip off the penny into the container before proceeding to the next step.

Step 3: Place penny on dry spot on a paper towel. Place drops of WATER on the penny (one at a time) until ANY amount of water runs over the edge of the penny.

Step 4: Record your observations and the number of drops for that trial in the table.

Repeat Steps 1 - 4 three more times before calculating the average.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Trial 1 | Trial 2 | Trial 3 | Trial 4 | Average |
|  |  |  |  |  |
| Trial 1 | Trial 2 | Trial 3 | Trial 4 | Average |
|  |  |  |  |  |

**Part C: Complete the following related to the experiment. It will be evaluated with Criteria C**

1. Create a graph that represents the data from the data table.
2. Describe and explain your results using empirical, scientific reasoning. Be sure to include your results from both parts of the experiment in terms of cohesion and surface tension.